

Serial No. 10/025,550
Docket No. H07-138280M/MNN

2

AMENDMENTS TO THE CLAIMS:

1. (Currently amended) An image forming method comprising:
developing an electrostatic latent image formed on an image carrier with a developing device into a toner image using toners;
transferring said toner image onto a recording medium; and
fixing said toner image transferred onto said recording medium to thereby form a recorded image on a recording sheet;

wherein said latent image is developed with said developing device by first and second developing rollers disposed along the moving direction of said image carrier and rotatable in the mutually opposite directions using a two-component magnetic developing agent including toners and magnetic carriers, and said toners are supplied to said latent image on said image carrier by said first and second developing rollers,

wherein the moving direction of said first developing roller is opposite to the moving direction of said image carrier in a developing area, and a peripheral speed ratio ($S1 = Vm1 / Vp$) between the peripheral speed ($Vm1$) of said first developing roller and the peripheral speed (Vp) of said image carrier is set in the range of 0.8 - 2.0,

wherein the moving direction of said second developing roller is the same as the moving direction of said image carrier in a developing area, and a peripheral speed ratio ($S2 = Vm2 / Vp$) between the peripheral speed ($Vm2$) of said second developing roller and the peripheral speed (Vp) of said image carrier is set in the range of 1.05 - 2.0, and

wherein a plurality of shape coefficients SF1, SF2 of said toners of said two-component magnetic developing agent including toners and magnetic carriers are respectively defined according to the following expressions (1) and (2),

$$SF1 = (\text{maximum length of diameter})^2 / (\text{area of toner particle}) \times \pi / 4 \times 100 \quad \text{--- (1)}$$

$$SF2 = (\text{peripheral length of projected image})^2 / (\text{area of toner particle}) \times 100 / 4 \pi \quad \text{---}$$

(2), said shape coefficients SF1, SF2 respectively satisfying the following conditions:

$$120 \leq SF1 \leq 170$$

$$110 \leq SF2 \leq 130, \text{ and}$$

wherein said shape coefficient SF2 is selected to provide a desired toner fluidity between said first and second developing rollers.

Serial No. 10/025,550
Docket No. H07-138280M/MNN

3

2. (Currently amended) An image forming method comprising:
developing an electrostatic latent image formed on an image carrier with a developing device into a toner image using toners;
transferring said toner image onto a recording medium; and
fixing said toner image transferred onto said recording medium to thereby form a recorded image on a recording sheet,

wherein said latent image is developed with said developing device by one or more sets of first and second developing rollers disposed along the moving direction of said image carrier and rotatable in the mutually opposite directions using a two-component magnetic developing agent including toners and magnetic carriers, and said toners are supplied to said latent image on said image carrier by said one or more sets of first and second developing rollers, and

wherein the moving direction of said first developing roller is opposite to the moving direction of said image carrier in a developing area, and a peripheral speed ratio ($S1 = Vm1 / Vp$) between the peripheral speed ($Vm1$) of said first developing roller and the peripheral speed (Vp) of said image carrier is set in the range of 0.8 - 2.0,

wherein the moving direction of said second developing roller is the same as the moving direction of said image carrier in a developing area, and a peripheral speed ratio ($S2 = Vm2 / Vp$) between the peripheral speed ($Vm2$) of said second developing roller and the peripheral speed (Vp) of said image carrier is set in the range of 1.05 - 2.0, and

wherein the shape coefficients SF1, SF2 of said toners of said two-component magnetic developing agent including toners and magnetic carriers are defined according to following expressions (1) and (2),

$$SF1 = (\text{maximum length of diameter})^2 / (\text{area of toner particle}) \times \pi / 4 \times 100 \quad \text{--- (1)}$$

$$SF2 = (\text{peripheral length of projected image})^2 / (\text{area of toner particle}) \times 100 / 4 \pi \quad \text{---}$$

(2), said shape coefficients SF1, SF2 respectively satisfying the following conditions:

$$120 \leq SF1 \leq 170$$

$$110 \leq SF2 \leq 130, \text{ and}$$

wherein said shape coefficient SF2 is selected to provide a desired toner fluidity between said first and second developing rollers.

Serial No. 10/025,550

4

Docket No. H07-138280M/MNN

3. (Currently amended) The image forming method of claim 1, wherein the peripheral speed ratio S1 is in a range from 0.9 to 1.9 exceeds 2.0.
4. (Currently amended) The image forming method of claim 1, wherein the peripheral speed ratio S2 is in a range from 1.1 to 1.9 exceeds 2.0.
5. (Currently amended) The image forming method of claim 1, wherein said toners comprise particles having particle diameters of 6 - 12 μm .
6. (Currently amended) The image forming method of claim 1, wherein said ~~using a two-~~ component magnetic developing agent comprises ~~using~~ a magnetic carrier that includes one of iron-powder-system carriers, ferrite-system carriers, and magnetite-system carriers,
wherein said carriers comprise particles having particle diameters in a of the carriers range from 50 - 150 μm .
7. (Currently amended) The image forming method of claim 2, wherein the peripheral speed ratio S1 is in a range from 0.9 to 1.9 exceeds 2.0.
8. (Currently amended) The image forming method of claim 2, wherein the peripheral speed ratio S2 is in a range from 1.1 to 1.9 exceeds 2.0.
9. (Currently amended) The image forming method of claim 2, wherein said toners comprise particles having particles-diameters of 6 - 12 μm .
10. (Currently amended) The image forming method of claim 2, wherein said ~~using a two-~~ component magnetic developing agent comprises ~~using~~ a magnetic carrier that includes one of iron-powder-system carriers, ferrite-system carriers, and magnetite-system carriers,
wherein carriers comprise particles having particle diameters in a of the carriers range from 50 - 150 μm .
11. (Withdrawn) An image forming apparatus, comprising:

Serial No. 10/025,550

5

Docket No. H07-138280M/MNN

a rotatable image carrier with a photoconductive characteristic;
an electric charger on the periphery of said image carrier for uniformly charging said photographic body;

a light beam for forming an electrostatic latent image on said image carrier;

a developing device comprising a first developing roller and a second developing roller for developing said electrostatic latent image to form a toner image on said image carrier,

wherein said latent image is developed by said first and second developing rollers disposed along the moving direction of said image carrier and rotatable in mutually opposite directions using a two-component magnetic developing agent including toners and magnetic carriers, said toners are supplied to said latent image on said image carrier by said first and second developing rollers,

wherein a circular shape of a particle of said toners is elongated along an axis, and

wherein a peripheral shape of said toner particle is formed unevenly.

12. (Withdrawn) The image forming apparatus of claim 11, wherein a moving direction of said first developing roller is opposite to a moving direction of said image carrier, and

a peripheral speed ratio ($S1 = Vm1 / Vp$) between the peripheral speed ($Vm1$) of said first developing roller and the peripheral speed (Vp) of said image carrier is set in the range of 0.8 - 2.0.

13. (Withdrawn) The image forming apparatus of claim 11, wherein the moving direction of said second developing roller is the same as the moving direction of said image carrier, and

a peripheral speed ratio ($S2 = Vm2 / Vp$) between the peripheral speed ($Vm2$) of said second developing roller and the peripheral speed (Vp) of said image carrier is set in the range of 1.05 - 2.0.

14. (Withdrawn) The image forming apparatus of claim 12, wherein the peripheral speed ratio $S1$ exceeds 2.0.

15. (Withdrawn) The image forming apparatus of claim 13, wherein the peripheral speed

Serial No. 10/025,550
Docket No. H07-138280M/MNN

6

ratio S2 exceeds 2.0.

16. (Withdrawn) The image forming apparatus of claim 11, further comprising:
a developing agent distributing member that delivers a two-component magnetic developing agent, said agent comprising a magnetic carrier that includes iron-powder-system carriers, ferrite-system carriers, and magnetite-system carriers,
wherein particle diameters of the carriers range from 50 - 150 μm .

17. (Withdrawn) The image forming apparatus of claim 11, wherein said toners comprise particle diameters of 6 - 12 μm .

18. (Withdrawn) The image forming apparatus of claim 13, wherein the peripheral speed ratio S2 exceeds 3.5.

19. (Withdrawn) The image forming apparatus of claim 11, wherein shape coefficient SF1 of said toner is respectively defined according to

$$\text{SF1} = (\text{maximum length of diameter})^2 / (\text{area of toner particle}) \times \pi / 4 \times 100,$$
 and
said shape coefficient SF1 satisfies the following condition:

$$120 \leq \text{SF1} \leq 170.$$

20. (Withdrawn) The image forming apparatus of claim 11, wherein shape coefficient SF2 of said toner is defined according to

$$\text{SF2} = (\text{peripheral length of projected image})^2 / (\text{area of toner particle}) \times 100 / 4 \pi,$$
 and
said shape coefficient SF1 satisfies the following condition:

$$110 \leq \text{SF2} \leq 130.$$